

Amendments to the Claims

Please amend Claims 1, 3-34, and 36-68. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Currently Amended) An apparatus for managing noise characteristics in a communication system for transmitting digital signals using a compression code comprising a predetermined plurality of parameters including a first parameter, said parameters representing an audio signal, said audio signal having a plurality of audio characteristics including a noise characteristic, said compression code being decodable by a plurality of decoding procedures, the apparatus for managing the noise characteristic comprising:
 - a reading unit responsive to said the compression code of said a digital signals signal to read at least said a first parameter[[,]] among a predetermined plurality of parameters in the digital signal;
 - a generation unit responsive to said a compression code and said the first parameter[[,]] a generation unit to generate an adjusted first parameter in a presence of speech, noise, and combination thereof;
 - a replacement unit to replace said the first parameter with said the adjusted first parameter; and
 - a transmitter to transmit said the digital signal with a managed noise characteristic.
2. (Canceled)
3. (Currently Amended) The Apparatus apparatus, as claimed in of claim 1[[,]] wherein said the first parameter comprises includes a codebook gain, and wherein said reading the generation unit is arranged to modifies modify said the codebook gain to modify a codebook vector contribution to said the noise characteristic.
4. (Currently Amended) The Apparatus apparatus, as claimed in of claim 1[[,]] wherein said the first parameter comprises includes a codebook gain, wherein said the plurality of

parameters further comprises includes a pitch gain, wherein said the plurality of characteristics further comprises includes a signal to noise ratio, and wherein said the reading generation unit is arranged to generate the adjusted first parameter, including an adjusted codebook gain, responsive to said the codebook gain, said the pitch gain and said the signal to noise ratio to generate said adjusted first parameter, and wherein said adjusted first parameter comprises an adjusted codebook gain.

5. (Currently Amended) The Apparatus apparatus, as claimed in of claim 4[[],] wherein said the signal to noise ratio comprises includes a ratio involving noisy signal power and noise power of said an audio signal.
6. (Currently Amended) The Apparatus apparatus, as claimed in of claim 1[[],] wherein said the first parameter comprises includes a pitch gain, wherein said the plurality of parameters further comprise includes a codebook gain, wherein said the reading unit is arranged to performs perform said the plurality of decoding procedures by generating a codebook vector, and wherein said the reading generation unit includes at least a first buffer to generate first samples based on pitch period responsive to the scaled codebook vector and is arranged to scale scale said the codebook vector by said the codebook gain to generate a scaled codebook vector, wherein said reading unit comprises at least a first buffer responsive to said scaled codebook vector to generate first samples based on pitch period, wherein said reading unit, scale[[s]] said the first samples by said the pitch gain to generate first scaled samples, and wherein said reading unit modifies said modify the pitch gain to modify the contribution of said the first scaled samples in order to manage said the noise characteristic.
7. (Currently Amended) The Apparatus apparatus, as claimed in of claim 1[[],] wherein said the first parameter comprises includes a pitch gain, wherein said the plurality of characteristics further comprises includes a signal to noise ratio, wherein said and the reading generation unit is arranged responsive to said pitch gain and said signal to noise ratio to generate said the adjusted first parameter, including an adjusted pitch gain.

responsive to the pitch gain and the signal to noise ratio[[],] and wherein said adjusted first parameter comprises an adjusted pitch gain.

8. (Currently Amended) The Apparatus apparatus , as claimed in of claim 7[[],] wherein said the signal to noise ratio comprises includes a ratio involving noisy signal power and noise power of said the audio signal.
9. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1[[],] wherein said the first parameter comprises includes a pitch gain, wherein said the plurality of parameters further comprise include a codebook gain, wherein said the reading unit is arranged to perform[[s]] said the plurality of decoding procedures to generate a codebook vector, wherein said reading and the generation unit is arranged to scale[[s]] said the codebook vector by said the codebook gain to generate a scaled codebook vector, wherein said reading unit generates a power signal representing the power of said the scaled codebook vector, wherein said reading unit and the adjusted first parameter, including an adjusted pitch gain, is responsive to said the pitch gain and said the power signal to generate said adjusted first parameter, and wherein said adjusted first parameter comprises an adjusted pitch gain.
10. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1[[],] wherein said the first parameter comprises includes a pitch gain, wherein said the reading generation unit comprises includes at least a first buffer generating at least first samples based on a pitch period[[],] and wherein said reading is arranged to scale[[s]] said the first samples by said the pitch gain to generate at least first scaled samples, wherein said reading unit generates generate at least a first power signal representing the power of said the first scaled samples[[],] and wherein said reading unit is generate the adjusted first parameter, including an adjusted pitch gain, responsive at least to said the pitch gain and said the first power signal to generate said adjusted first parameter, and wherein said adjusted first parameter comprises an adjusted pitch gain.

11. (Currently Amended) The Apparatus apparatus, as claimed in of claim 10[.,.] wherein said the reading generation unit comprises includes a second buffer responsive in part to said the first power signal to generate second samples based on the pitch period, wherein said the reading unit and is arranged to scales scale said the second samples by said the pitch gain to generate second scaled samples, wherein said reading unit generates generate a second power signal representing the power of said the second scaled samples, and wherein said reading unit the adjusted first parameter is responsive to said the pitch gain, said the first power signal and said the second power signal to generate said adjusted first parameter.
12. (Currently Amended) The Apparatus apparatus, as claimed in of claim 11[.,.] wherein said the first buffer and said the second buffer each comprises include a long-term predictor buffer.
13. (Currently Amended) The Apparatus apparatus, as claimed in of claim 1[.,.] wherein said the first parameter comprises includes a pitch gain, wherein said the plurality of parameters further comprises includes a codebook gain, wherein said the reading generation unit comprises includes a pitch synthesis filter, wherein said reading unit and is arranged to performs perform said the plurality of decoding procedures to generate a first vector, wherein said reading unit scales scale said the first vector by said the codebook gain to generate a scaled codebook vector, wherein said reading unit filters filter said the scaled codebook vector through said the pitch synthesis filter to generate a second vector, wherein said reading unit generates generate a power signal representing the power of said the second vector[.,.] and wherein said reading unit is responsive to said pitch gain and said power signal to generate said the adjusted first parameter, including an adjusted pitch gain, responsive to the pitch gain and the power signal, and wherein said adjusted first parameter comprises an adjusted pitch gain.
14. (Currently Amended) The Apparatus apparatus, as claimed in of claim 13[.,.] wherein said the first vector comprises includes a codebook excitation vector and wherein said the second vector comprises includes a linear predictive coding excitation vector.

15. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [.,.] wherein said the first parameter comprises includes a codebook vector comprising including pulses using variable sets of amplitudes, wherein said reading the generation unit is arranged to analyzes analyze said the sets to identify the powers of said the noise characteristic represented by said the sets[.,.] wherein said reading unit identifies and a first set representing a power less than the power represented by said the sets other than said the first set, and wherein said reading unit adjust[[s]] said the pulses according to said the first set to generate said adjusted parameter.
16. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [.,.] wherein said the plurality of decoding procedures further comprises includes at least one decoding procedure that does not substantially affect the management of the noise characteristic and wherein said the reading unit avoids performing said the at least one decoding procedure.
17. (Currently Amended) The Apparatus apparatus , as claimed in of claim 16 [.,.] wherein said the at least one decoding procedure comprises includes post-filtering.
18. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [.,.] wherein said the compression code comprises includes a linear predictive code.
19. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [.,.] wherein said the compression code comprises includes regular pulse excitation long term prediction code.
20. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [.,.] wherein said the compression code comprises includes code-excited linear prediction code.
21. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [.,.] wherein said the first parameter is a quantized first parameter and wherein said the reading generation unit is arranged to generates said generate the adjusted first parameter in part by quantizing

said the adjusted first parameter before replacing said the first parameter with said the adjusted first parameter.

22. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [[,]] wherein said the compression code is arranged in frames of said the digital signals and wherein said the frames comprise include a plurality of subframes each comprising said including the first parameter, wherein said the reading unit is responsive to said the compression code to read at least said the first parameter from each of said the plurality of subframes, and wherein said the reading replacement unit is arranged to replacees replace said the first parameter with said the adjusted first parameter in each of said the plurality of subframes.
23. (Currently Amended) The Apparatus apparatus , as claimed in of claim 22 [[,]] wherein said the reading replacement unit is arranged to replacees replace said the first parameter with said the adjusted first parameter for a first subframe before processing a subframe following the first subframe to achieve lower delay.
24. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [[,]] wherein said the compression code is arranged in frames of said the digital signals and wherein said the frames comprise a plurality of subframes each comprising said including the first parameter, wherein said the reading unit is arranged to begin[[s]] to perform said the decoding procedures during a first of said the subframes[[,]] to generate a plurality of said the decoded signals, read[[s]] said the first parameter from a second of said the subframes occurring subsequent to said the first subframe, and the generation unit is arranged to generate[[s]] said the adjusted first parameter in response to said the decoded signals and said the first parameter, and the replacement unit is arranged to replace[[s]] said the first parameter of said the second subframe with said the adjusted first parameter.
25. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [[,]] wherein said the reading unit is responsive to said the compression code to perform at least one of a plurality of said the decoding procedures to generate decoded signals and wherein said the

reading generation unit is responsive to said the decoded signals and said the first parameter to generate said the adjusted first parameter.

26. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [[,]] wherein said the first parameter is selected from a group consisting of codebook vector, codebook gain, pitch gain and LPC coefficients representations, including line spectral frequencies and log area ratios.
27. (Currently Amended) The Apparatus apparatus , as claimed in of claim 1 [[,]] wherein said the audio digital signals have spectral regions affected by said the noise characteristic, wherein said the first parameter comprises a representation of linear predictive coding coefficients, wherein said and the reading generation unit is arranged to determine the spectral regions affected by noise is responsive to said the compression code and said the representation to determine said spectral regions affected by noise and to generate said the adjusted first parameter, including an adjusted representation of linear predictive coding coefficients, to manage said the noise characteristic in said the regions, and wherein said adjusted first parameter comprises an adjusted representation of linear predictive coding coefficients.
28. (Currently Amended) The Apparatus apparatus , as claimed in of claim 27 [[,]] wherein said the representation of linear predictive coding coefficients is selected from a group consisting including of line spectral frequencies and log area ratios.
29. (Currently Amended) An apparatus for managing the noise characteristic in in a communication system for transmitting digital signals comprising including code samples, said the code samples comprising including first bits using a compression code and second bits using a linear code, said code samples representing an audio signal, said audio signal having a plurality of audio characteristics including a noise characteristic, the apparatus for managing the noise characteristic comprising:

a reading unit responsive to said the second bits to adjust said the first bits and said the second bits, without decoding said the compression code, to manage the noise characteristic in the digital signals; and

a transmitter module unit to transmit adjusted first and second bits to a device to produce a corresponding audible signal with a managed noise characteristic for an end user.

30. (Currently Amended) The Apparatus apparatus, as claimed in of claim 29 [[,]] wherein said the linear code comprises includes pulse code modulation (PCM) code.
31. (Currently Amended) The Apparatus apparatus, as claimed in of claim 29 [[,]] wherein said the compression code samples conform to the tandem-free operation of the global system for mobile communications standard.
32. (Currently Amended) The Apparatus apparatus, as claimed in of claim 29 [[,]] wherein said the first bits comprise include the two least significant bits of said the samples and wherein said the second bits comprise include the [[6]] six most significant bits of said samples.
33. (Currently Amended) The Apparatus apparatus, as claimed in of claim 32 [[,]] wherein said the [[6]] six most significant bits comprise include PCM code.
34. (Currently Amended) A method for managing noise characteristics in in a communication system for transmitting digital signals using a compression code, the compression code including comprising a predetermined plurality of parameters including a first parameter, said parameters representing an audio signal, said audio signal having a plurality of audio characteristics including a noise characteristic, said compression code being decodable by a plurality of decoding procedures, a the method of managing the noise characteristic comprising:

reading at least said first parameter;

generating an adjusted first parameter in a presence of speech, noise, and combination thereof in response to said the compression code and said the first parameter; replacing said the first parameter with said the adjusted first parameter, and transmitting said the digital signal with a managed noise characteristic.

35. (Canceled)
36. (Currently Amended) The A method, as claimed in of claim 34[[],] wherein said the first parameter comprises includes a codebook gain, and wherein said method further including comprises modifying said the codebook gain to modify a codebook vector contribution to said the noise characteristic.
37. (Currently Amended) The A method, as claimed in of claim 34[[],] wherein said the first parameter comprises includes a codebook gain, wherein said the plurality of parameters further comprises includes a pitch gain, wherein said the plurality of characteristics further comprises includes a signal to noise ratio and wherein said generating comprises further including generating said the adjusted first parameter, including an adjusted codebook gain, in response to said the codebook gain, said the pitch gain and said the signal to noise ratio; and wherein said adjusted first parameter comprises an adjusted codebook gain.
38. (Currently Amended) The A method, as claimed in of claim 37[[],] wherein said the signal to noise ratio comprises includes a ratio involving noisy signal power and noise power of said an audio signal.
39. (Currently Amended) The A method, as claimed in of claim 34[[],] wherein said the first parameter includes a pitch gain, wherein said the plurality of parameters further includes a codebook gain, wherein said generating comprises and further including performing said the plurality of decoding procedures by generating a codebook vector, scaling said the codebook vector by said the codebook gain to generate a scaled codebook vector, generating first

samples based on pitch period in response to said the scaled codebook vector, scaling said the first samples by said the pitch gain to generate first scaled samples, and modifying said the pitch gain to modify the contribution of said the first scaled samples in order to manage said the noise characteristic.

40. (Currently Amended) The A method, as claimed in of claim 34[.] wherein said the first parameter comprises includes a pitch gain, wherein said the plurality of characteristics further comprises includes a signal to noise ratio, wherein said generating comprises and further including generating said the adjusted first parameter, including an adjusted pitch gain, in response to said the pitch gain and said signal to noise ratio, and wherein said adjusted first parameter comprises an adjusted pitch gain.
41. (Currently Amended) The A method, as claimed in of claim 40[.] wherein said the signal to noise ratio comprises includes a ratio involving noisy signal power and noise power of said the audio signal.
42. (Currently Amended) The A method, as claimed in of claim 34[.] wherein said the first parameter comprises includes a pitch gain, wherein said the plurality of parameters further comprises include a codebook gain, wherein said the generating comprises and further including performing said the plurality of decoding procedures to generate a codebook vector, scaling said codebook vector by said the codebook gain to generate a scaled codebook vector, generating a power signal representing the power of said the scaled codebook vector, and generating said the adjusted first parameter, including an adjusted pitch gain, in response to said the pitch gain and said the power signal, and wherein said adjusted first parameter comprises an adjusted pitch gain.
43. (Currently Amended) The A method, as claimed in of claim 34[.] wherein said the first parameter comprises includes pitch gain, wherein said the generating comprises includes generating at least first samples based on pitch period, scaling said the first samples by said the pitch gain to generate at least first scaled samples, generating at least a first power signal

representing the power of said the first scaled samples, and generating said the adjusted first parameter, including an adjusted pitch gain, in response to at least said the pitch gain and said the first power signal, and wherein said adjusted first parameter comprises an adjusted pitch gain.

44. (Currently Amended) The A method, as claimed in of claim 43 [.,.] wherein said generating further comprises including generating second samples based on pitch period responsive in part to said the first power signal, scaling said the second samples by said the pitch gain to generate second scaled samples, generating a second power signal representing the power of said the second scaled samples and generating said the adjusted first parameter in response to said the pitch gain, said the first power signal and said the second power signal.
45. (Currently Amended) The A method, as claimed in of claim 44[.,.] wherein said the system comprises includes one or more long-term predictor buffers and wherein said further including generating said the first and second samples comprises using said the one or more buffers.
46. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the first parameter comprises includes a pitch gain, wherein said the plurality of parameters comprises includes a codebook gain, and wherein said further including generating comprises performing said the plurality of decoding procedures to generate a first vector, scaling said the first vector by said the codebook gain to generate a scaled codebook vector, filtering said the scaled codebook vector by pitch synthesis filtering to generate a second vector, generating a power signal representing the power of said the second vector, and generating said the adjusted first parameter, including an adjusted pitch gain, in response to said the pitch gain and said the power signal, and wherein said adjusted first parameter comprises an adjusted pitch gain.

47. (Currently Amended) The A method, as claimed in of claim 46[.,.] wherein said the first vector comprises includes a codebook excitation vector and wherein said the second vector comprises includes a linear predictive coding excitation vector.

48. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the first parameter comprises includes a codebook vector comprising including pulses using variable sets of amplitudes, wherein said generating comprises and further including analyzing said the sets to identify the powers of said noise characteristic represented by said the sets, identifying a first set representing a power less than the power represented by said the sets other than said first set, and adjusting said the pulses according to said the first set to generate said the adjusted parameter.

49. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the plurality of decoding procedures further comprises includes at least one decoding procedure that does not substantially affect the management of the noise characteristic and wherein said the generating avoids performing said the at least one decoding procedure.

50. (Currently Amended) The A method, as claimed in of claim 49[.,.] wherein said the at least one decoding procedure comprises includes post-filtering.

51. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the compression code comprises includes a linear predictive code.

52. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the compression code comprises includes regular pulse excitation long term prediction code.

53. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the compression code comprises includes code-excited linear prediction code.

54. (Currently Amended) The A method, as claimed in of claim 34[.] wherein said the first parameter is a quantized first parameter and wherein said the generating comprises includes generating said the adjusted first parameter in part by quantizing said the adjusted first parameter before replacing said the first parameter with said the adjusted first parameter.

55. (Currently Amended) The A method, as claimed in of claim 34[.] wherein said the compression code is arranged in frames of said the digital signals and wherein said the frames comprise include a plurality of subframes each comprising said including the first parameter, wherein said reading comprises and further including reading at least said the first parameter from each of said the plurality of subframes in response to said the compression code, and wherein said replacing comprises replacing said the first parameter with said the adjusted first parameter in each of said the plurality of subframes.

56. (Currently Amended) The A method, as claimed in of claim 55[.] wherein said replacing comprises further including replacing said the first parameter with said the adjusted first parameter for a first subframe before processing a subframe following the first subframe to achieve lower delay.

57. (Currently Amended) The A method, as claimed in of claim 34[.] wherein said the compression code is arranged in frames of said the digital signals and said the frames comprises includes a plurality of subframes each comprising said including the first parameter, wherein said generating comprises includes beginning to perform said the decoding procedures during a first of said the subframes to generate a plurality of said the decoded signals, wherein said reading comprises and further including reading said the first parameter from a second of said the subframes occurring subsequent to said the first subframe, wherein said the generating further and further including generating said the adjusted first parameter in response to said the decoded signals and said the first parameter, and wherein said replacing comprises replacing said the first parameter of said the second subframe with said the adjusted first parameter.

58. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said generating comprises further including performing at least one of a plurality of said the decoding procedures to generate decoded signals in response to said the compression code and generating said the adjusted first parameter in response to said the decoded signals and said the first parameter.

59. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the first parameter is selected from a group consisting of codebook vector, codebook gain, pitch gain and LPC coefficients representations, including line spectral pairs and line spectral frequencies.

60. (Currently Amended) The A method, as claimed in of claim 34[.,.] wherein said the audio signals have spectral regions affected by said noise characteristic, wherein said the first parameter comprises includes a representation of linear predictive coding coefficients, and wherein said generating comprises further including determining said the spectral regions affected by noise in response to said the compression code and said the representation and generating said the adjusted first parameter, including an adjusted representation of linear predictive coding coefficients, to manage said the noise characteristic in said the regions, and wherein said adjusted first parameter comprises an adjusted representation of linear predictive coding coefficients.

61. (Currently Amended) The A method, as claimed in of claim 60[.,.] wherein said the representation of linear predictive coding coefficients is selected from a group consisting of including line spectral frequencies and log area ratios.

62. (Currently Amended) A method for managing the noise characteristic in a communication system for transmitting digital signals comprising including code samples, said the code samples comprising including first bits using a compression code and second bits using a linear code, said code samples representing an audio signal, said audio signal

having a plurality of audio characteristics including a noise characteristic, the apparatus for managing the noise characteristic comprising:

adjusting said the first bits and said the second bits in response to said the second bits, without decoding said the compression code, to manage the noise characteristic in the digital signals in a presence of speech, noise, and combination thereof; and

transmitting adjusted first and second bits to a device to produce a corresponding audible signal with a managed noise characteristic for an end user.

63. (Currently Amended) The A method, as claimed in of claim 62[.,.] wherein said the linear code ~~comprises~~ includes pulse code modulation (PCM) code.
64. (Currently Amended) The A method, as claimed in of claim 62[.,.] wherein said the code samples conform to the tandem-free operation of the global system for mobile communications standard.
65. (Currently Amended) The A method, as claimed in of claim 62[.,.] wherein said the first bits ~~comprise~~ include the two least significant bits of said the samples and wherein said the second bits ~~comprise~~ include the 6 ~~six~~ most significant bits of said samples.
66. (Currently Amended) The A method, as claimed in of claim 65[.,.] wherein said the 6 ~~six~~ most significant bits include PCM code.
67. (Currently Amended) The Apparatus apparatus, as claimed in of claim 1[.,.] wherein said the reading unit performs said the plurality of decoding procedures by performing first decoding procedures to generate first decoder signals resulting in a noisy speech signal and second decoding procedures to generate second decoder signals resulting in an estimated clean speech signal, and wherein said the reading generation unit responds at least to said the first decoder signals and said the second decoder signals and said the first parameter to generate said the adjusted first parameter.

68. (Currently Amended) The A method, as claimed in of claim 34[[],] and further comprising:
performing said the plurality of decoding procedures by performing first decoding procedures to generate first decoder signals resulting in a noisy speech signal and second decoding procedures to generate second decoder signals resulting in an estimated clean speech signal; and
responding at least to said the first decoder signals and said the second decoder signals and said the first parameter to generate said the adjusted first parameter.